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Ash-trees. Several readers of these Bulletins have asked that something be said in them about Ash-trees. *Fraxinus* is the name of the genus to which all Ash-trees belong, although it may be well to say that the trees called Mountain Ashes are not Ashes but belong to the genus *Sorbus*, a member of the Rose Family and closely related to the Pears, Apples and Chokeberries. Ash-trees occur in nearly every temperate part of the Northern Hemisphere, but are more abundant in species in eastern North America than in other parts of the world. Ash-trees fall naturally into two groups; those of the first group are furnished with narrow white petals (*Ornus*) and the flowers of those in the second group are destitute of petals. The best known tree of the first group is the little tree called Manna Ash or Flowering Ash (*Fraxinus Ornus*) a native of southeastern Europe which has long been an inhabitant of the gardens of western Europe. It grows well in the middle Atlantic States, but has never been a success in the Arboretum where a tree which had flowered in 1917 was killed to the ground by the extreme cold of the following winter. Three of the flowering Ashes are natives of the United States, *Fraxinus cuspidata* and *F. Greggii* of the Mexican boundary region and *F. dipetala* of the mountain valleys of California. These three plants are not in the Arboretum collection where they would not be hardy, but *Ornus* is well represented here by two eastern Asiatic species, *Fraxinus Bungeana*, a small shrub from northern China which was first raised here in 1882, and by the Japanese *Fraxinus longicuspis* which grows in the Arboretum both as a shrub with several spreading stems and as a small tree. Of the Ash-trees without petals and therefore with inconspicuous

flowers there are seventeen species with a number of more or less distinct varieties which are natives of the United States. Six of these trees grow in the northeastern part of the country and three of them are common New England trees. To these trees color names have for no very obvious reason been given, at least in books, for it is doubtful if these names have any general application among persons whose knowledge of trees has come from an intimacy of association with them in the forest or by the roadside, and not from the study of other persons' ideas about them recorded in printed pages. To persons who know trees from books White Ash, Black Ash, Green Ash, Red Ash and Blue Ash are familiar names. The most valuable of the American Ashes as a timber tree and one of the handsomest of the whole genus, the so-called White Ash, *Fraxinus americana*, grows naturally from Nova Scotia to Florida and eastern Texas, and westward to Nebraska and Oklahoma. It is a splendid tree often, when conditions of soil and rainfall favor it more than one hundred feet high with a tall massive trunk five or six feet in diameter. If anyone in northeastern North America wants an Ash-tree for shade or to produce timber, *Fraxinus americana* is the tree to plant. It grows, too, better in western Europe than most eastern American trees, although it will probably not become as good a tree there as the native Ash. A variety of *Fraxinus americana* (var. *subcoriacea*) differs from the common form in its thicker, entire or only slightly toothed leaflets which are silvery white on their lower surface. This tree was raised at the Arboretum in 1874 from seeds collected at Mt. Victory in central Ohio. It is therefore now one of the oldest trees raised here. This Ohio tree has grown more rapidly and is handsomer than any other Ash-tree which has been planted in the Arboretum. Seeds of this tree usually reproduce the variety, and it is this variety which should be planted when the best possible Ash-tree is wanted in this part of the country. The Black Ash, *Fraxinus nigra*, grows as far north as Newfoundland and the shores of Lake Winnipeg, that is, further north than the other American Ash-trees, and is a common New England tree. It grows naturally in deep cold swamps and on the low banks of lakes and streams, and long resisted every effort made to establish it in the Arboretum until Mr. Dawson tried the experiment of grafting it on roots of the White Ash. These grafted plants although still small are growing well in peat soil on the left-hand side of the Meadow Road near the Rhamnus Collection. *Fraxinus pennsylvanica*, the so-called Red Ash, is another tree widely distributed over the eastern part of the continent from New Brunswick and southern Dakota southward. It is a smaller tree than the White Ash, rarely growing more than fifty or sixty feet tall, with a trunk less than two feet in diameter a narrow head of thin foliage, and branchlets covered with pubescence. The inner surface of the bark of this tree is sometimes red when first cut; the wood is about as valuable as that of the White Ash, but for shade or ornament *Fraxinus pennsylvanica* is not worth planting. The Green Ash is now usually considered a variety of *Fraxinus pennsylvanica* (var. *lanceolata*), and is most abundant in the valley of the Mississippi River and westward. It is easily distinguished by the bright green color of the two surfaces of the usually narrow leaflets. Seeds of the Green Ash germinate easily and quantities of seedling plants are found on the sand-bars and banks of many western

rivers. It is a popular tree, therefore, in western nurseries, and, although not suited for the purpose, has been largely planted in the west as a street and shade tree, and occasionally also in the east for American nurseries have often substituted it for the White Ash. Another Ash of the Mississippi Valley, the Blue Ash of popular tree books, *Fraxinus quadrangulata*, owes its scientific name to its four-angled branchlets. This is one of the noble trees of the American forest, almost rivalling the White Ash in size. This tree grows naturally in limestone soil, but it has grown well in the Arboretum where it is helped by occasional applications of lime. Two southern trees related to the White Ash, *Fraxinus biltmorianana*, with densely pubescent branchlets, of the southern Appalachian region and westward, and *F. texensis* with rounded leaflets and a native of central and western Texas, are established in the Arboretum. Three species of the southeastern states and the five species of New Mexico and Arizona will probably never live very long in Massachusetts, although the curious little *Fraxinus anomala* with square branchlets and leaves usually reduced to a single leaflet at one time flourished in the Arboretum during several years. *Fraxinus oregona*, the Pacific coast Ash-tree, is a large and handsome tree and one of the few valuable deciduous-leaved timber trees of the northwest. It has proved hardy in the Arboretum where it grows well but where it will probably never become a large tree.

Of the Old-World Ash-trees the best known is *Fraxinus excelsior*, one of the important timber trees of the world, and as it grows in western and central Europe often a magnificent tree sometimes nearly one hundred and fifty feet high with a tall massive trunk three or four feet in diameter. A number of abnormal forms of this tree have appeared in European nurseries and plantations, but *F. excelsior* and its varieties are miserable trees in New England and should not be planted here. *Fraxinus rotundifolia* and its variety with pendulous branches are established in the Arboretum. They are small trees, natives of southern Europe and southwestern Asia, and although interesting from the botanists' point of view add little to the beauty of a collection of trees. An Ash-tree from Turkestan and Songaria (*F. potamo-phylla*) was raised at the Arboretum in 1878 and has grown rapidly into a handsome, shapely and hardy tree. As an ornamental tree this is the most promising of the exotic Ashes which have been planted in the Arboretum. The great Ash-tree of northeastern Asia, *Fraxinus mandshurica*, inhabits eastern Siberia, Manchuria, Korea, and northern Japan. It is a really splendid tree and produces wood of exceptionally good quality. This tree was first raised in the Arboretum in 1878. It is hardy and grows well for a few years but soon begins to fail and become unsightly, and no place has yet been found in the Arboretum which suits it. In 1882 the Arboretum received seeds from Peking of *Fraxinus chinensis* var. *rhyncophylla*; it has grown well and has now flowered and produced fertile seeds for several years. It is a small and not particularly shapely tree, and is most interesting in winter, for the buds are unlike those of other Ash-trees and are globose, half an inch in diameter with broad scales covered with a thick coat of rufous tomentum. The outer scales, which are smaller than the others, do not as in most Ash-trees cover the bud which is enclosed by the second pair of scales; and on the terminal bud these

outer scales are reduced to thickened reflex tips which stand out like ears. Several Ash-trees discovered by Wilson in western China have been raised at the Arboretum and are now growing in its nurseries. Of these *Fraxinus platypoda* has grown the most rapidly, but it is too soon to form an idea of the value of these trees in American plantations.

Ash-trees require deep, rich, moist soil and as they usually unfold their leaves late and lose them early in the autumn they are not good trees to plant to shade streets and sidewalks. They are often injured while young by borers, and they are all liable to suffer from the attacks of the oyster shell scale.

Rosa multibracteata is one of the last of the new Chinese Roses to flower. It is an attractive plant with small leaves and small flowers in clusters, the clear pale pink petals being deeply notched at the apex. Vigorous young shoots of this Rose are thickly covered with bright red prickles and greatly add to its beauty at the time when it is in flower.

Rosa gallica var. *officinalis* is flowering for the first time in the Arboretum. It is one of the Province Roses and is sometimes called *Rosa provincialis*. The large, handsome, partly double red flowers are more fragrant than those of most modern Roses. This Rose is common in several old gardens in the town of Medfield in this state. No one now knows when and by whom it was brought there. It has long been known in French gardens, and there is a beautiful picture of it by Redouté in his great work on Roses published in Paris more than a century ago. There is a form of this Rose with paler-colored flowers which is growing in a garden in Weston in this state which was brought from New Hampshire where it is said to be common in old gardens. Tradition credits the Huguenots with having brought this Rose to America.

Tripterygium Regelii is flowering well again this year in the Shrub Collection and on Hickory Path near Centre Street. It is a near relative of the Bitter Sweet (*Celastrus*) and a native of Japan and Korea. It is a half climbing shrub with stems sometimes forty or fifty feet long in its native countries, large, long-pointed, dark green leaves, and small white flowers in great terminal clusters which are followed by three-lobed and three-winged fruits. This plant flowered in the Arboretum when not more than three feet high. The small plants have erect, self-supporting stems, but large plants will need the support of trees, shrubs or rocks over which to stray. This hardy shrub is well suited for covering rocky banks or hillsides in our northern states.

Rhododendron (*Azalea*) *viscosum*, which is the latest of the Azaleas to flower in the Arboretum, is in bloom. It is a common plant in the swamps of southern New England where it is usually known as "Swamp Honeysuckle." The small, pure white, clammy flowers which continue to open during several weeks are hidden by the new shoots of the year which are often fully grown before the first flowers open, and the great value of this Azalea is found in the fragrance of the flowers which make the neighborhood of an Azalea swamp delightful. Although it grows naturally in swamps, this Azalea grows equally well transferred to a garden border or to a hillside, as on Azalea Path in the Arboretum where many of these plants are now covered with flowers.